

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Public Notice)
)
Office of Engineering and Technology) ET Docket No. 17-215
Announces Technological Advisory Council)
(TAC) Technical Inquiry into Reforming)
Technical Regulations)

To: Chief, Office of Engineering and Technology

**COMMENTS OF
THE BOEING COMPANY**

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SUMMARY

The Commission should streamline certain of its rules to assist manufacturers and promote commerce, including its rules for the incorporation of wireless, ultrasonic and digital components in products and large equipment. Presently, Section 15.103 of the Commission's rules exempts from the equipment authorization requirements digital computing components used in a wide variety of products and equipment, including aircraft, automobiles, home appliances, and specialized medical equipment. The existence of these exemptions has not resulted in harmful interference to other authorized spectrum uses. At the same time, these exemptions have freed manufacturers to employ digital computer processing in an ever increasing number of products and equipment, enabling them to provide additional services to consumers, while operating more efficiently and using less power.

The Commission should create an additional exemption in Section 15.103 of its rules for digital processing components employed within maritime vessels, particularly autonomous maritime vessels that are rapidly being developed for both surface and submersible operations. The justifications for exempting such components in maritime vessels is as compelling – if not more so – as the long standing justification for exempting components in aircraft and automobiles.

The Commission should also expand the scope of the exemptions that it maintains in Section 15.103 of its rules. Specifically, the Commission should create identical exemptions from its equipment approval requirements for industrial, scientific, and medical (“ISM”) devices under Part 18 of its rules, particularly for non-consumer ISM equipment. The operating conditions of most ISM equipment are very similar to digital processing devices employed by manufacturers in products and equipment. Further, Commission precedent already exists for

such an exemption, which is reflected in the Commission's exemption for ISM equipment employed in specialized medical devices.

The Commission should also create identical exemptions for Part 15 transmitters that operate through induction. Inductive transmitters that limit their emissions into free space below the levels designated for unintentional radiators (*i.e.*, Section 15.109) should be exempted from the Commission's equipment authorization requirements. Inductive transmitters are employed by manufacturers in a wide variety of products and equipment and pose no greater risk of causing harmful interference to other authorized spectrum uses than the digital processing devices that have long been exempt from the Commission's equipment authorization rules pursuant to Section 15.103.

The Commission should also update its rules for the testing of emergency locator transmitters ("ELT") on aircraft. When the Commission first adopted its ELT testing rules in 1973, the rules specifically acknowledged that, in certain situations, ELTs on aircraft may be tested outside with very brief emissions into free space. In 1998, however, the Commission adopted a streamlined version of its ELT testing rule that was not intended to include any substantive changes to the Commission's requirements. The new rule (Section 87.197), however, precludes the testing of ELTs in open air conditions even though no other option is reasonably available for most large aircraft. Therefore, the Commission should either restore its original ELT test requirements, or simply indicate in its rules that ELT testing must be performed in conformance with FAA regulations.

Finally, the Commission should eliminate its requirement in Section 87.73 of its rules that an individual holding a general radiotelephone operator license must directly supervise and be responsible for the installation and testing of an aircraft radio station. Although the physical

presence of a licensed general radiotelephone operator may have some benefit during installation or repairs on the radio system of an existing aircraft in the field, no such benefits exist with respect to the installation and testing of a radio system in an aircraft during the manufacturing process. Every step that takes place in the manufacture of an aircraft is undertaken by skilled professions using detailed checklists and procedures. The presence of a licensed general radiotelephone operator provides no benefit to this process and creates an additional incremental cost in the manufacturing process.

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**COMMENTS OF
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The Boeing Company (“Boeing”) provides these comments in response to the Commission’s Public Notice seeking to identify technical restrictions and regulatory processes that are obsolete or should be modified to increase efficiency and decrease regulatory burdens while still maintaining the purposes and responsibilities of the Commission.

As a global leader in the design and manufacture of aircraft and aerospace systems, Boeing employs a very wide range of wireless systems, including for research and development, for worker safety and automated manufacturing, for aircraft flight testing, and incorporated within the operational systems of each aircraft, defense system, and space vehicle manufactured by Boeing. Because of this critical dependency on spectrum resources, Boeing routinely holds more FCC experimental licenses than any other entity.

Boeing also purchases and imports substantial quantities of aircraft and space system components from countless vendors and engages in exhaustive efforts to confirm the equipment verification or certification status of each of these devices, often having to educate technology vendors regarding the complexities of the Commission’s equipment approval and importation rules. In addition, Boeing routinely provides comment to the Commission on rulemakings and public

notices intended to improve the Commissions' regulatory requirements and optimize its management of scarce spectrum resources to facilitate the growth of new licensed and unlicensed communications services, while ensuring the safe and reliable operation of existing spectrum uses supporting public safety, disaster relief, aircraft navigation and landing systems, flight testing, radar, precision location, and satellite broadband and video distribution, to name a few. With this background, Boeing welcomes the Commission's invitation to identify technical rules and processes that would benefit from modification or elimination in order to increase the efficiency of the Commission's regulations and reduce regulatory burdens on domestic commerce.

I. THE COMMISSION SHOULD GREATLY EXPAND ITS RULES FOR EXEMPTED DIGITAL DEVICES TO ELIMINATE UNNECESSARY BURDENS IN ITS EQUIPMENT APPROVAL PROCESSES

The spectrum usage environment in the United States has evolved exponentially in the past two decades and the Commission's rules need to evolve with it. Today, small computer processing devices are routinely carried by nearly every person and are incorporated within the electronics of a wide variety of "things," from cars and appliances, to toys, entertainment devices, manufacturing systems, and other useful equipment. Radio signals radiate (or leak) from most of these devices, including in restricted frequency bands that are used for the most sensitive communications equipment.

Presciently, the Commission began regulating the RF emissions of digital devices in 1979 because of concern that the proliferation of these electronic products could interfere with radio and television reception.¹ The Commission adopted RF emissions limits for products containing digital computing equipment, which are reflected in Section 15.109 of the Commission's rules.

¹ See Amendment of Part 15 to Redefine and Clarify the Rules Governing Restricted Radiation Devices and Low Power Communication Devices, *First Report*, FCC 79-555 (Oct. 11, 1979).

These limits – expressed in microvolts per meter – are divided into two categories (Class A and Class B digital devices), with slightly more stringent emission limits for digital computing devices that are likely to be used in residential settings near sensitive radio and television receivers. Today, small computing devices that comply with these restrictions are in use everywhere and, as a result, manufacturers of radio communications equipment and other sensitive devices routinely design their products to tolerate this baseline noise.

Shortly after the Commission adopted its rules for digital devices, the Commission recognized the need to create exemptions for digital devices that are incorporated into larger equipment, specifically automobiles and aircraft.² Such devices are subject only to the general requirement to refrain from causing harmful interference.³ The Commission explained that this exemption was warranted because special testing procedures would likely be needed for such devices, the potential benefits of which would unlikely be justified by the costs.⁴

In 1981, the Commission created an additional exemption for specialized medical digital devices.⁵ The Commission observed that an exemption was justified “particularly in view of the

² See Amendment of Part 15 to Redefine and Clarify the Rules Governing Restricted Radiation Devices and Low Power Communication Devices, FCC 80-148, *Order on Reconsideration*, 79 F.C.C.2d 67, ¶¶ 54-55 (April 9, 1980) (“1980 Order on Reconsideration”).

³ See 47 C.F.R. § 15.103 (explaining that such devices are subject only to the general conditions of operation in §§ 15.5 and 15.29). The exemptions that are currently included in Section 15.103 were originally codified as temporary exemptions in Section 15.801 of the Commission’s rules. See Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License, FCC 89-103, 4 FCC Rcd 3493, *First Report and Order*, ¶ 141 n.61 (April 18, 1989) (moving the exemptions from Section 15.801 to Section 15.103 of the Commission’s rules and making the exemptions permanent).

⁴ See 1980 Order on Reconsideration, ¶ 55.

⁵ See Request of General Electric Company to Exempt Medical Diagnostic Equipment From Subpart J of Part 15 of the Rules of the Federal Communications Commission, FCC 82-301, *Report and Order*, 90 F.C.C.2d 666 (July 9, 1982).

many factors which minimize the likelihood of interference, and in view of the high costs of compliance.”⁶ Today, the Commission maintains a lengthy list of exempted digital computing devices, including exemptions for digital devices used in:

- (a) transportation vehicles including motor vehicles and aircraft;
- (b) electronic control or power systems used by a public utility or in an industrial plant;
- (c) industrial, commercial, or medical test equipment;
- (d) appliances, *e.g.*, microwave oven, dishwasher, clothes dryer, air conditioner, etc.;
- (e) specialized medical digital devices;
- (f) devices that have a power consumption not exceeding 6 nW;
- (g) joystick controllers or similar devices, such as a mouse; and
- (h) certain devices in which both the highest frequency generated and the highest frequency used are less than 1.705 MHz.

With respect to all of these exempted digital devices, the exemption was warranted based on “evidence indicating that the risk of interference was minimal and that the cost of compliance with a specific emanation requirement would be high.”⁷

The existence of these exemptions has permitted equipment manufacturers to incorporate digital computing devices in a myriad of products and systems without resulting in harmful interference to other important spectrum uses. This general absence of harmful interference has resulted from several factors. Many digital processing devices are incorporated within larger products that include outer casings or chassis that effectively shield much of the radiated emissions. Many of these larger products also incorporate multiple RF components within them that must be

⁶ *Id.*, ¶ 13.

⁷ Amendment of the Exemptions in Subpart J of Part 15 of the Commission Rules for Controlling the Interference Potential of Computers and Similar Electronic Equipment, FCC 84-401, *Notice of Proposed Rulemaking*, 98 F.C.C.2d 1211, ¶ 7 (Aug. 21, 1984).

shielded from each other to ensure the reliable operation of the larger product. In addition, some of the products that contain exempted digital devices are used in medical, aviation and industrial settings where trained personnel can manage their placement and operation. Finally, the RF emissions from most of these exempted digital devices are so low that they would not create an interference concern regardless of how or where they are used.

As a result, the Commission's permissive treatment of exempted digital devices, combined with its relatively modest regulation of digital devices that are not subject to an exemption, has been tremendously successful. Digital computing devices generally do not cause harmful interference into licensed or unlicensed wireless systems. At the same time, manufacturers have been able to incorporate inexpensive digital computing devices into nearly all types of products and equipment, enabling those products to operate more effectively and efficiently, using less power and providing more services to consumers than could ever have been possible without these computing capabilities.

Given the Commission's tremendous success in this area, Boeing urges the Commission to employ these same principals to other equipment and devices that are regulated by the Commission under its rules. Specifically, the Commission should employ these same exemptions to industrial, scientific, and medical ("ISM") equipment regulated under Part 18 of the Commission's rules. The Commission should also employ these same exemptions to inductive transmitters that radiate incidentally into free space at very lower power levels. Finally, the Commission should create a new exemption for maritime vessels, particularly to support the rapidly developing field of autonomous maritime vessels. The expansion of the Commission's exemptions in this manner will further facilitate their incorporation and use within a wide variety of products and equipment that are made available by manufacturers to benefit consumers and commerce in the United States.

A. The Commission Should Adopt Identical Exemptions for Industrial, Scientific, and Medical Equipment Under Part 18 of its Rules

The Commission has historically maintained separate rules for low power RF transmitting equipment used for communications (which are generally regulated under Part 15) and RF transmitting equipment used for ISM purposes (which are regulated under Part 18). The divergent regulatory treatment is based solely on this difference in use, not because of appreciable difference in their potential impact on the interference environment.

In practice, the usage conditions for ISM equipment are very similar to the usage conditions for digital computing devices. As the Commission's rules observe, typical ISM applications are the production of physical, biological, or chemical effects such as heating, ionization of gases, mechanical vibrations, hair removal and acceleration of charged particles.⁸ Many ISM systems are incorporated within larger products that include outer casings or chassis that effectively shield emissions. Some of these larger products also incorporate multiple RF components, necessitating that these components be shielded from each other. In addition, nearly all non-residential ISM systems are used in professional or industrial settings where trained personnel can manage their placement and operation. Finally, the RF emissions from most ISM devices are so low that they would not create an interference concern regardless of how or where they are employed.

Given these facts, the Commission should adopt in Part 18 of its rules the same exemptions for ISM equipment that it maintains in Section 15.103 of its rules for digital computing devices. This would permit manufacturers to incorporate Part 18 capabilities into various products and equipment using the same flexibility that exists for digital computing devices.

⁸ See 47 C.F.R. §18.107(c).

In advocating for this expansion of the Commission's rules for exempted devices, Boeing acknowledges an important difference between Part 15 digital computing devices and Part 18 ISM equipment – the former are unintentional radiators, while the latter are intentional radiators. To address this distinction, Boeing proposes two solutions, which are not mutually exclusive. The Commission could limit the application of its exemption solely to non-consumer ISM equipment. The Commission could also apply its exemption to both consumer and non-consumer ISM equipment, but restrict its application to those types of non-consumer ISM devices that operate at relatively low power levels.

1. In Exempting ISM Equipment From Equipment Approval and Other Regulatory Requirements, the Commission Could Limit its Exemption to Non-Consumer ISM Devices

To establish parity between its rules for digital processing devices and ISM equipment, the Commission could consider limiting its exemption for Part 18 equipment to non-consumer ISM devices. The Commission's rules already distinguish between consumer and non-consumer ISM equipment, defining the former as "equipment used or intended to be used by the general public in a residential environment, notwithstanding use in other areas" such as "domestic microwave ovens, jewelry cleaners for home use, [and] ultrasonic humidifiers."⁹

Precedent exists for the Commission's treatment of non-consumer ISM equipment in the same permissive manner as exempted digital computing devices. In 1986, the Commission adopted an exemption for non-consumer medical ultrasonic equipment from the testing

⁹ See 47 C.F.R. §18.107(g).

requirements of Part 18.¹⁰ In 1994, the Commission expanded this exemption to include non-consumer magnetic resonance equipment.¹¹ Advocates for these exemptions highlighted the fact that the RF emissions produced by the ultrasonic portions of such equipment were comparable to the RF emissions from the digital processing portions of these same devices, the latter of which had already been exempted by the Commission from the testing requirements of Part 15.¹² In concurring with this position, the Commission observed that the interference risks of such an exemption were minimal and the reduced costs to medical equipment manufacturers would be significant.¹³

The Commission should reach this same conclusion with respect to all other forms of non-consumer ISM equipment, particularly ISM equipment used as components on aircraft. Most such aircraft components are not modular, meaning they cannot be tested as separate devices prior to their incorporation into aircraft systems. Further, such components do not generate RF energy in their unassembled state. Thus, testing such components prior to their installation on aircraft is difficult. Once assembled as a part of the aircraft, testing becomes even more difficult because the component is often housed deep within the aircraft frame.

As an example, Boeing installs ultrasonic water detectors within the fuel tanks of large aircraft. These devices are assembled within the hull of the aircraft, making them difficult to test

¹⁰ See Amendment of Part 18 of the FCC Rules to exempt medical ultrasonic diagnostic and monitoring equipment from technical standards, FCC 86-493, *Report and Order*, 1 FCC Rcd 553 (Nov. 12, 1986) (“1986 Part 18 Order”).

¹¹ See Amendment to Part 18 to Remove Unnecessary Regulations Regarding Magnetic Resonance Systems, FCC 94-155, 9 FCC Rcd 3389 (July 12, 1994) (“1994 Part 18 Order”).

¹² 1986 Part 18 Order, ¶¶ 2 and 4.

¹³ See *id.*, ¶ 6; see also 1994 Part 18 Order, ¶ 6.

prior to their installation. Once installed, the transmissions from these sensors are largely undetectable outside the aircraft. For these reasons, it is both impractical and unnecessary to continue to impose the Commission's equipment approval rules to these Part 18 devices.

As a second example, Boeing equips all major aircraft with ultrasonic emergency locator beacons, which activate only if submerged in water. The beacons are Part 18 devices because they use RF energy to generate an underwater acoustic beacon and do not transmit an RF signal. Importantly, given the fact that the devices are activated only when submerged in water, they pose no interference threat to other spectrum uses and therefore should appropriately be treated as exempted devices.

Numerous other aircraft components employ ISM technology. In designing aircraft to incorporate such components, Boeing employs extreme diligence to ensure that any RF emissions that leak from such components are adequately shielded so that they cannot affect critical communication and navigation systems, other RF components, or consumer devices that are permitted within the cabin of the aircraft. Boeing also completes thorough RF emissions testing of the entire aircraft once it is assembled to ensure that RF transmissions produced either within the aircraft or from external sources do not interfere with the safe, effective and reliable operation of aircraft flight systems. Boeing anticipates that manufacturers of other large devices, such as automobiles, take similar precautions.

Countless examples exist of ISM technologies that are employed in products and equipment in a manner that do not pose a risk of harmful interference to other spectrum uses. The Commission should therefore apply the same exemption that it employs for digital computing devices to all non-consumer ISM equipment in order to promote the expanded use of such technologies by manufacturers.

2. In Exempting ISM Equipment, the Commission Could Also Exempt Consumer ISM Devices That Operate at Relatively Low Power

In addition to adopting exemptions for all non-consumer ISM equipment, the Commission should also consider exemptions for ISM equipment that is intended for use by consumers as long as the ISM device transmits at a relatively low power level. As discussed in the opening section of these comments, the interference environment in the United States is influenced significantly by Section 15.109 of the Commission's rules, which specifies the maximum emissions that may "leak" from digital processing devices and the products that contain them. Many of these digital processing devices are appropriately exempt from the Commission's equipment approval requirements pursuant to Section 15.103 of the rules.

It would be consistent to adopt the same exemptions for all consumer ISM equipment that operates below the transmission limits specified in Section 15.109(a), which specifies the limits for digital processing devices employed in residential environments. Although Boeing has not investigated the power levels that are customarily employed by consumer ISM equipment, Boeing anticipates that the use of exemptions for consumer ISM devices that operate below the Section 15.109(a) power levels potentially could relieve a significant amount of such equipment from the Commission's equipment authorization requirements, thereby reducing the regulatory burdens of the Commission's equipment approval rules.

B. The Commission Should Adopt Identical Exemptions for Intentional Transmitters That Operate Through Induction

It would likely surprise many manufacturers of electronic devices to learn that the Commission regulates inductive communications devices as intentional radiators.¹⁴ Thus, the

¹⁴ See 47 C.F.R. §15.3(o) (defining an intentional radiator as "a device that intentionally generates and emits radio frequency energy by radiation or induction").

same equipment approval rules that exist for transmitters that employ antennas and broadcast signals into free space also apply to devices that use RF energy to transmit communications between objects that are in physical contact. Here again, an exemption from the Commission's equipment authorization rules would be appropriate.

Inductive transmitters function in a very similar manner to unintentional radiators in that they generate RF energy, a portion of which "leaks" into the air. The only difference is that inductive transmitters generate RF energy intentionally, while unintentional radiators do not. The practical impact of these devices on the spectrum environment, however, is identical and, for this reason, inductive transmitters and unintentional radiators should be regulated in the same manner. Specifically, the Commission should exempt all inductive transmitters that "leak" RF energy at levels that do not exceed the emission limits of Section 15.209(a) (for inductive transmitters used in residential settings) or Section 15.109(b) (for inductive transmitters used in non-residential settings).

As an example, Boeing installs pressure sensors on the tires of each Boeing aircraft. These sensors function as both Part 18 ISM devices and as Part 15 inductive transmitters. In its Part 18 mode, the sensor terminal (which is attached to the wheel assembly) transmits RF energy to the sensor inside the tire in order to power the sensor. In its Part 15 mode, the sensor inside the tire uses RF energy to transmit air pressure data back to the terminal, which then relays the information to the cockpit. Both of these RF transmissions occur through induction involving physical contact between the sensor components and the wheel assembly. Thus, RF emissions into free space are negligible.

As with other aircraft components, testing aircraft tire pressure sensors for compliance with the Commission's equipment authorization rules is very difficult. The sensors are not modular

and are difficult to test in their unassembled state prior to their installation within the aircraft landing gear. Once assembled within the landing gear, the RF emissions outside the wheel assembly are negligible.

Numerous other aircraft components employ inductive transmitters to communicate data within the aircraft. As noted above, Boeing employs extreme diligence to ensure that any RF emissions that leak from such components are adequately shielded so they cannot affect critical communication and navigation systems, other RF components, or consumer devices that are permitted within the cabin of the aircraft.

Given these facts, it would be appropriate to reduce the regulatory burdens on manufacturers by adopting the same exemptions for low power inductive transmitters (*i.e.*, those that do not exceed the Section 15.109 power limits) that the Commission has long maintained for digital computing devices. Such a change would give manufacturers greater flexibility in incorporating low power inductive transmitters within products and equipment while creating no appreciable risk of causing harmful interference to other spectrum uses.

C. The Commission Should Create an Additional Exemption of its Equipment Authorization Rules for Maritime Vessels

As the Commission is aware, rapid technological developments are currently taking place with respect to aircraft and automobiles involving the use of wireless systems, computer processing, and sensors in order to enable them to operate in a more safe and efficient manner, with the potential ultimate goal of autonomous operations. Less well known is that these same technological developments are taking place in the maritime sector, where autonomous surface and submersible vessels are already being deployed for various beneficial purposes. These autonomous vessels employ large numbers of wireless systems, computer processors, and ultrasonic sensors in order to navigate, operate safely, and execute their missions.

Given the fact that these vessels are autonomous, their operations pose no risk of harmful RF interference to individuals or other authorized spectrum uses. Nevertheless, the Commission's rules currently do not include an exemption from the equipment authorization requirements for the various Part 15 and Part 18 components that they contain. Boeing therefore recommends that the Commission create a new exemption in Section 15.103 of its rules for digital processing devices that are employed within maritime vessels. Consistent with Boeing's comments above, this new exemption should also be applied to Part 18 ISM equipment and Part 15 intentional inductive transmitters.

It would be justifiable to apply this new exemption to all forms of maritime vessels, not just those that operate autonomously. The Commission's existing exemptions for aircraft and automobile components have not resulted in appreciable interference to other authorized spectrum uses. There is no reason to believe that an exemption for components employed on maritime vessels would produce a different result. Instead, maritime vessels are usually much larger and spacious than aircraft or automobiles, with much greater segregation between the areas designated for passenger and the vessel's operational systems. Therefore, an exemption for components used in all maritime vessels would be warranted.

If the Commission is hesitant to adopt an exemption for all maritime vessels, Boeing would urge the Commission to adopt expeditiously an exemption solely for autonomous maritime vessels, including both surface and submersible vessels. Such an exemption would provide immediate benefits to equipment manufacturers by permitting them to employ wireless sensors and ultrasonic equipment more expeditiously and in greater quantities on autonomous vessels in order to further enhance their operations and their ability to operate in a safe and efficient manner.

II. THE COMMISSION SHOULD RESTORE THE FLEXIBILITY THAT PREVIOUSLY EXISTED IN ITS RULES FOR TESTING EMERGENCY LOCATOR BEACONS ON AIRCRAFT

On December 29, 1970, federal legislation was enacted that required emergency locator beacons to be installed on certain types of aircraft.¹⁵ In response to this law, the FAA adopted regulations requiring that ELT transmitters be installed on aircraft and be tested every twelve months to ensure “[t]he presence of a sufficient signal radiated from its antenna.”¹⁶

The Commission also adopted rules for the licensing, operation and testing of ELT transmitters.¹⁷ The adopted rules encouraged aircraft operators to use test procedures that avoided transmitting test signals into the frequency bands authorized for ELTs. The rules acknowledged, however, that if fully shielded tests were not possible, then “brief operational tests are authorized provided the tests are conducted within the first five minutes of any hour, are not longer than three audio sweeps, and, if the antenna is removable, a dummy load is substituted during the test.”¹⁸

About fifteen years later, the Commission adopted a Notice of Proposed Rulemaking (“NPRM”) on changes to its rules for aviation services, including ELT transmitters, that were intended to “simplify and to clarify the rules and to deregulate in several areas, which should provide more flexibility for aviation communications.”¹⁹ The NPRM explained that the

¹⁵ See Public Law 91-596, § 31 (49 U.S.C. § 142).

¹⁶ See 14 C.F.R. 91.207(d)(4).

¹⁷ See Emergency Locator Transmitters, Proposed Licensing and Use, FCC 73-278, Report and Order, 39 F.C.C.2d 1004 (March 13, 1973) (“1973 Order”).

¹⁸ 47 C.F.R. § 87.93 (1973) (Routine Tests).

¹⁹ See Reorganization and Revision of Part 87 of the Rules. Governing the Aviation Services, FCC 87-207, Notice of Proposed Rulemaking, 2 FCC Rcd 4069 (1987).

Commission's proposed changes to its rules would "reduce the body of aviation rules by approximately 30 percent."²⁰ The Commission also proposed to re-number its ELT rules and move them to a new sub-part.²¹ The NPRM explained, however, that "[n]o substantive changes were made to the original rules now contained in this subpart."²²

The revised test rule for aircraft ELTs was, as suggested, much shorter than the original rule. It was, however, substantively very different, stating only "ELT testing must avoid outside radiation. Bench and ground tests conducted outside of an RF-shielded enclosure must be conducted with the ELT terminated into a dummy load."²³

In 1988, the Commission issued a Report & Order that adopted the revised ELT rule without altering it from the language proposed in the NPRM.²⁴ The Report & Order did not discuss the significant changes that were being made to the ELT test rules, instead reasserting "[a]ll references to Emergency Locator Transmitters (ELTs) have been moved into Subpart F. Aircraft stations. No substantive changes were made to the original rules now contained in this subpart."²⁵ The heavily revised rule remains in place today as Section 87.197.²⁶

Unfortunately, it is often not always possible for aircraft owners to test ELT transmitters without resulting in some level of outside radiation. For example, it is usually not possible to

²⁰ *Id.*, ¶ 1.

²¹ *See id.*, ¶ 7.

²² *Id.*

²³ *See id.*, Appendix A.

²⁴ *See* Reorganization and Revision of Part 87 of the Rules Governing the Aviation Services, FCC 88-210, *Report and Order*, 3 FCC Rcd 4171 (1988).

²⁵ *Id.*, ¶ 27.

²⁶ 47 C.F.R. § 87.197 (1989).

locate an aircraft inside an RF-shielded enclosure (particularly large commercial aircraft) where tests can be conducted without outside emissions. Further, the ELT transmitter antennas on large commercial aircraft cannot be removed at reasonable expense and replaced with a dummy load.

For these reasons, the Commission should revise its rules for testing of ELT devices on aircraft in order to restore the ability to conduct outside tests of such devices as long as the tests are conducted pursuant to the reasonable limits set forth in the Commission's original rule, specifically "within the first five minutes of any hour" and not exceeding "three audio sweeps."²⁷ Alternatively, the Commission should revise its ELT testing rules simply to indicate that all such testing must be completed in compliance with FAA requirements. Such a change would be consistent with the practical realities of the aviation industry and would therefore eliminate a significant impediment to regulatory compliance by aircraft operators.

III. THE COMMISSION SHOULD ELIMINATE ITS REQUIREMENT THAT A LICENSED RADIO OPERATOR BE PRESENT DURING THE INSTALLATION AND TESTING OF RADIOS IN NEW AIRCRAFT

The manufacture of commercial aircraft involves the detailed assembly of tens of thousands of systems and components into each airframe that is constructed. Boeing maintains exhaustive procedures for this manufacturing process, which include documented inspections and tests of each installed component.

One of the many modular components that is installed on each aircraft is the aircraft radio system. The procedures that Boeing employs for the installation of the aircraft radio system are as detailed as those employed for any other critical component of the aircraft. The Commission's rules, however, specify that additional measures must be taken for the installation and testing of

²⁷ 47 C.F.R. § 87.93 (1973).

aircraft radio systems. Specifically, Section 87.73 requires that “[a] general radiotelephone operator must directly supervise and be responsible for all transmitter adjustments or tests during installation, servicing or maintenance of a radio station.”²⁸ In a 2013 decision, the Commission interpreted this supervisory requirement as necessitating the “on-site presence” of a licensed general radiotelephone operator.²⁹

Boeing acknowledges the potential benefits that may result from having a licensed general radiotelephone operator present during the servicing, maintenance, or installation of an aircraft radio system on an existing aircraft in the field, such as at an airport. Such potential benefits do not exist, however, with respect to the installation and testing of an aircraft radio system in a new aircraft during the manufacturing process. As with all other steps in the assembly process, skilled professionals carry out each task using detailed written procedures and checklists. The test procedures for aircraft radio systems also involve systematic written instructions with requirements that each step be completed successfully before the next step can be initiated. If the tests on an aircraft radio system are not successful, it is removed and sent back to the manufacturer. No attempt is made to service the radio system during the installation process.

Given these facts, the Commission should modify its rules for the installation and maintenance of aircraft radio systems to eliminate the unnecessary requirement for a licensed general radiotelephone operator to be present during the installation of an aircraft radio system during the assembly of a new aircraft. Such a change would serve the public interest by reducing

²⁸ 47 C.F.R. § 87.73.

²⁹ See Potomac Aviation Technology Corp. Request for Waiver of Sections 87.71 and 87.73 of the Commission Rules, WT Docket No 09-42, *Order*, DA 10-316 (Feb. 25, 2010).

incrementally the cost of constructing new aircraft without reducing the safety or efficiency of the manufacturing process.

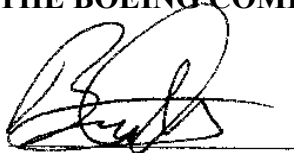
IV. CONCLUSION

Boeing appreciates the initiative of the Commission and its TAC in issuing a public notice seeking comment on technical regulations and processes that could be modified or eliminated in order to increase efficiency, while decreasing regulatory burdens on commerce. Boeing believes that the modifications to technical rules that it is proposing in these comments would substantially benefit U.S. manufacturers and their consumers while fully maintaining the Commission's regulatory role and without resulting in any additional RF interference to authorized spectrum uses. Boeing therefore urges the Commission and its TAC to take steps to implement these recommendations expeditiously.

Respectfully submitted,

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